IN THE CLAIMS:

The following is a complete listing of the claims in this application, reflects all changes currently being made to the claims, and replaces all earlier versions and all earlier listings of the claims:

Claim 1. (currently amended): An information processing device for aiding control operations relating to controlling the position and orientation of a virtual object, said device comprising:

image-capturing means for capturing a real ~~image~~ object in real space into a taken image;

~~estimating means for estimating the position and orientation of the image capturing means;~~

virtual image generation means for generating a virtual image of a virtual object according to the position and orientation of said image capturing means;

synthesizing means for synthesizing the virtual image generated by said virtual image generation means with the taken image generated by said image-capturing means;

virtual object placement shape storage means for storing the shape of the virtual object;

virtual object operating means for performing six-degree-of-freedom operations of said virtual object;

constraining shape input means for specifying three-dimensional coordinates respectively of points on a constraining plane to indicate at the same time the shape and position

of the constraining plane in said real space;

constraining shape generating means for generating a constraining shape based on at least one said constraining plane; and

operation aiding means for generating restrictions on the operations performed by said virtual object operating means based on the shape stored in said virtual object placement shape storage means and the constraining shape generated by said constraining shape generating means.

~~superimposed means for superimposing the generated virtual image with the captured real image;~~

~~determination means for determining an input of a constraining shape or an operation of the virtual object;~~

~~inputting means for inputting three-dimensional position information of a plurality of positions inputted by moving an input unit in the real space by a user, the input unit being capable of measuring the position and orientation in the real space;~~

~~setting means for setting a constraining shape by using a shape generated based on the inputted three-dimensional position information in case of the input of the constraining shape; and~~

~~operating means for performing an operation controlling the position and the orientation of the virtual object based on the constraining shape in accordance with a user's instructions in case of the operation of the virtual object.~~

Claim 2. (previously presented): An information processing device according to Claim 1, wherein the constraining shape is defined by polygons and the apexes of the polygons are at positions inputted by the user or the constraining shape is a plane passing through the positions inputted by the user.

Claim 3. (currently amended): An information processing device according to Claim 1, wherein said operating aiding means performs at least one of the following operations in performing an operation controlling the position and orientation of the virtual object:

a translation operation for causing translational movement of the virtual object based on the constraining shape; and/or

a rotation operation for rotating the virtual object on an axis which is a normal vector at a plane where the constraining shape and the virtual object come into contact.

Claim 4. (canceled).

Claim 5. (currently amended): An information processing method for aiding control operations relating to controlling the position and orientation of a virtual object, said method comprising:

an image capturing step of capturing a real ~~image~~ object in real space into a taken image by using an image capturing device;

~~an estimating step of estimating the position and orientation of the image capturing device;~~

a virtual image generation step of generating a virtual image of a virtual object according to the position and orientation of said image capturing device;

a synthesizing step of synthesizing the virtual image generated from said virtual image generation step with the taken image generated from said image capturing step;

a virtual object placement shape storage step of storing the shape of the virtual object;

a virtual object operating step of performing six-degree-of-freedom operations of said virtual object;

a constraining shape input step of specifying three-dimensional coordinates respectively of points on a constraining plane to indicate at the same time the shape and position of the constraining plane in said real space;

a constraining shape generating step of generating a constraining shape based on at least one said constraining plane; and

an operation aiding step of generating restrictions on the operations performed in said virtual object operating step based on the shape stored in said virtual object placement shape storage step and the constraining shape generated from said constraining shape generating step.

~~a superimposing step of superimposing the generated virtual image with the captured real image;~~

~~a determination step of determining an input of a constraining shape or an operation of the virtual object;~~

~~an inputting step of inputting three dimensional position information of a~~

~~plurality of positions inputted by moving an input unit in the real space by a user, the input unit being capable of measuring the position and orientation in the real space;~~

~~a setting step of setting a constraining shape by using a shape generated based on the inputted three dimensional position information in case of the input of the constraining shape; and~~

~~an operating step for performing an operation controlling the position and the orientation of the virtual object based on the constraining shape in accordance with a user's instructions in case of the operation of the virtual object.~~

Claim 6. (currently amended): An information processing method according to Claim 5,

wherein said ~~setting~~ constrain shape generating step includes ~~setting~~ generating a constraining shape defined by polygons, the apexes of the polygons being at positions inputted by the user in said ~~inputting~~ constraining shape input step or ~~setting~~ generating a constraining shape comprising a plane passing through the positions inputted by the user in said ~~inputting~~ constraining shape input step.

Claim 7. (currently amended): An information processing method according to Claim 6, wherein said operating aiding step comprises the steps of:

causing translational movement of the virtual object based on the constraining shape; and

rotating the virtual object on an axis which is a normal vector at a plane where

the constraining shape and the virtual object come into contact.

Claim 8. (currently amended): A ~~computer program product comprising a~~ computer readable medium storing a computer program ~~code~~ for performing the information processing method according to Claim 5, wherein the information processing method is executed by a computer device.

Claim 9. - Claim 19. (cancelled).